

argiolus, *Nomiades semiargus*, *Nemobius lucina*, *Apatura iris* and ab. *iole*, *A. ilia* and ab. *eos* and ab. *iliades*, *Limenitis camilla*, *L. sibylla*, *L. populi*, *Polygonia c-album*, *Eugonia polychloros*, *Aglais urticae*, *Vanessa io*, *Euranessa antiopa*, *Pyrameis cardui*, *Melitaea didyma*, *M. dictynna*, *M. athalia*, *M. parthenie*, *Brenthis dia*, *Issoria latona*, *Argynnis niobe* ab. *eris*, *A. adippe* and ab. *cleodora*, *Dryas paphia*, *Melanargia galathea*, *Satyrus hermione*, *S. circe*, *Hipparchia semele*, *Pararge macra*, *P. egeria* var. *egerides*, *P. achine* (very common), *Epinephele ianira*, *E. tithonus*, *Enodia hyperanthus*, *Coenonympha arcania*, *C. pamphilus*, *Hesperia carthami*, *Adopaea flava* (*thauwas*), *Argiales sylvanus*, *Cyclopius palaeon* (one, June 18th, 1906). Of noticeable Geometrids, *Thalera jimbrialis*, *Larentia hydrata* (one each). On my way to Switzerland, *viâ* Bâle, I turned off to Friborg-in-Baden, and made my first acquaintance with *Melitaea maturna*, typical form, just out, June 8th, and *Coenonympha hero*, very worn and nearly over.

Notes on the hibernating habits, etc., of *Pyrameis atalanta*.

By Paymaster-in-Chief GERVASE F. MATHEW, R.N.

In the February number of the *Ent. Record*, p. 47, Mr. H. W. Head raises the question as to whether *Pyrameis atalanta* hibernates in this country, and gives it as his opinion that it does not, and asks if there is any authentic record of its doing so. I think this query will come rather as a surprise to many, who, like myself, have always considered this insect as one of our ordinary hibernating species. As far as my personal experience goes, I can recollect seeing it on three or four occasions in mid-winter—(1) one was found hibernating in a broken flower-pot in an out-house; (2) another was found lying on the ground under a wall, from whence some thick ivy had just been stripped; (3) another was seen fluttering about the window of a harness-room, on a bright warm day in January or February; and (4) one was found lying on a pathway, having evidently been recently disturbed from its winter quarters. Unfortunately I have not the dates of the above instances, as they occurred many years before I kept a journal, but there is no doubt that the facts were as stated. Since then I have frequently seen the butterfly in May—possibly earlier—and early June, and have looked on these as hibernated examples. But I have always had an idea that *P. atalanta* was the last of the Vanessids to go into hibernation, and the last to appear the following spring, and I think it is now pretty generally believed that all the British species hibernate in the perfect state, and that impregnation takes place in the spring. Many of them go into hibernation soon after assuming the perfect state, and are seldom seen in the autumn. *P. atalanta* appears to linger the longest, and is often seen enjoying the sweets of ivy bloom, on bright days, late in October, or even to the beginning of November, but it takes a longer sleep than the others, and does not reappear until well into May, or the beginning of June.

Some entomologists seem to think that in certain seasons this butterfly is double-brooded, but I fancy this is a mistake caused by the fact that it is a long-lived species, and females deposit their ova from June until August, so that the offspring of the same parent may be living as larvæ, pupæ, or even imagines, at the same time. I remem-

ber that, during one summer, a very ragged female haunted the side of a wood for many weeks.

On looking through what few works I have on British butterflies, and various magazines, I find very little is said about the hibernating habits of this species, but most of the authors appear to assume that it does. Perhaps it would be interesting to give some extracts.

(1) Rennie, in his *Conspectus of Butterflies and Moths found in Britain*, published in 1832, says, at p. 10, "appears in spring, the middle of July, and the beginning of August, until November." He calls it the "Alderman," *Ammiralis atalanta*, Rennie.

(2) Stainton says nothing about the hibernation of *P. atalanta*, but, on the contrary, he seems to assume that it does not do so. At p. 22, vol. i., he remarks, "of this family (*Nymphalidae*) the first that greets us in the spring are the hibernating *Vanessae*—*io*, *polychloros*, and *urticae* (which we find in lanes, in gardens, and not unfrequently in houses); and even *antiopa*, when it does appear, may be found in April . . . In August . . . *Vanessa atalanta* begins to join its congeners at sucking sweets from the flowers and fruits of our gardens." And after his description of the species follows the date of appearance—"viii.-xb." But for *io* he gives, "iii.-vh., viii.-ix"; *polychloros*, "iii.-vh., vii.-viii."; and *urticae*, "iii.-vh., vi.-ix."

(3) Newman, in *British Butterflies*, p. 63, says, "both sexes hibernate early; they reappear in the spring, but later than our other *Vanessidae*: the usual intercourse then takes place, and oviposition follows."

(4) Lang, in *Butterflies of Europe*, p. 177, "Times of appearance.—June to October, and after hibernation in the spring."

(5) Kane, in *Handbook of European Butterflies*, does not allude to the hibernating habits of any of the *Nymphalidae*, except in the case of *urticae*, where, at p. 61, he mentions that "the pale costal blotches of fore- and hindwings are much bleached in hibernated specimens."

(6) Meyrick, *Handbook of British Lepidoptera*, assumes that it hibernates, as he gives "9-6" for its time of appearance.

(7) Barrett, in *The Lepidoptera of the British Islands*, vol. i., at p. 147, for time of appearance gives, "September and October, and, after hibernation, in June," and at p. 148 he writes, "It is quite the latest species, with us, to retire for hibernation. I have seen it upon the wing until the end of October, and even into November—though this is exceptional—and, on the other hand, it is the last to reappear; hot weather late in May will sometimes bring it out, but, as a general rule, it is not to be seen until June. It has then lost its familiarity and fondness for gardens, and usually frequents trees; but, before the end of the month its eggs are deposited and its life is over. Although so common, its favourite places of hibernation seem to be almost unknown or unnoticed."

(8) South, *Complete Pocket Guide, Wayside and Woodland Series*, at p. 83, says, "The butterflies seen in spring, early summer, up to, say, the beginning of July, are supposed to have wintered in this country, but there is no positive evidence, that I can find, that the butterfly does hibernate here. It is, however, most probable that they are arrivals from abroad. The species is found throughout Europe and North Africa, northern Asia, and North America, and it may be suspected of migration, although there is, perhaps, not such conclu-

sive evidence on this point as in the case of its cousin, the Painted Lady."

(9) Dale, *British Butterflies*, p. 149, writes, "It remains on the wing till the beginning of November, so long as the ivy is in bloom and the frosts not too severe, when it hibernates. It does not emerge from its winter-quarters as early as other hibernating species, and is very seldom seen."

(10) In the *Entomologist's Weekly Intelligencer*, no. 243, for June 1st, 1861, attention is called to a paper by Herr von Prittwitz, in a recent number of the *Stettin. Entomologische Zeitung*, on the winter forms of Silesian Rhopalocera, in which it is stated that (1) *atalanta*, *antiopa*, and *urticæ* pass the winter in the imago state, and (2) that *cardui*, *io*, *c-album*, and *polychloros* pass the winter both in the imago and pupa states; but the author did not appear to have had a very correct knowledge of how many species passed the winter, for he included *Argynnis adippe* and *Nemeobius lucina* among those species that hibernate as larvæ, whereas it is now well known that the former passes winter in the ova and the latter in the pupa state.

(11) *Entomologist's Monthly Magazine*, vol. 26, for 1890. At pp. 185-6, Dr. R. C. R. Jordan, in a paper on the British Macro-Lepidoptera which hibernate in the perfect state, includes *P. atalanta*, but does not say very much about it. He remarks that *P. atalanta* and *P. cardui*, though undoubtedly living through the winter, are never found in any numbers after this time, however abundant they may have been in the October previous." In the same magazine, vol. xxix., p. 261, Mr. C. W. Dale, of Glanvilles Wootton, Dorset, notes having seen "several hibernated specimens on the wing during April and May." In vol. xxxviii., p. 62, Mr. W. T. Page notes having seen *atalanta* as late as December 3rd, and adds that he has records of having seen it in October, November, December, January, and February.

(12) *Entomologist*, vol. viii. Mr. W. A. Luff records that, on March 6th of that year, Mrs. Boley found several small larvæ spun up in nettles in a lane in Guernsey. These fed up and produced butterflies in May. In vol. xxiii., p. 257, Mr. Frohawk says, "the hibernated specimens deposit eggs in May and June. In vol. xxxiii., p. 351, Mr. C. W. Dale gives March 29th, 1819, for early, and November 18th for late, appearance of this species.

(13) *Entomologist's Record*, vol. iv., 1893, p. 152, Mr. B. S. Harwood records a capture of *atalanta* on April 26th. Ditto, ditto, p. 170, Mr. Tutt says, "*atalanta* is to be seen every year, in greater or less numbers, from March to June, sometimes as late as July." At p. 180, Miss Hinchliff records the capture of one at Instow, North Devon, on April 23rd. In vol. v., 1894, p. 24, "Current Notes.—Larvæ (of *atalanta*) received from Skibbereen, Co. Cork, on January 11th. Rather (very) unusual." In vol. vii., 1895-6, p. 4, Mr. J. W. Tutt writes, "*atalanta* does not go into hibernation until the ivy nectar fails." In vol. viii., 1896, p. 4, Mr. Wolfe notes that he obtained very young larvæ up to the end of October, and bred the imagines (in doors) in January and February, and suggests that pupæ and larvæ out-of-doors would be killed by the first frosts. At p. 100, Mr. J. W. Tutt, in a paper on the "Hibernating stages of British Butterflies," says (of *atalanta*) it hibernates in the perfect state. At p. 169, Mr. F. Merrifield agrees with Mr. Tutt that *atalanta* cannot hibernate as

pupæ in England, his reason being that he never found they could survive a long exposure to winter temperature. In vol. ix., 1897, pp. 249-51, in a paper "On a collection of Spring Lepidoptera made in the Riviera, etc.," Mr. J. W. Tutt notices, on the authority of Dr. Chapman, the occurrence of *atalanta* in February, and further quotes Chapman as saying that, at Cannes, "during last winter *P. atalanta* was always in evidence, the same individuals at the same places (apparently, and probably really) all the winter, the imagines not emerging or ovipositing, as far as one could judge, but hibernating without hiding away, except on dull and cold days." In this paper Mr. Tutt remarks, "It is well known that the imago of this species never goes into hibernation in the autumn, in Britain, until obliged, feasting first on the hop catkins and later on ivy bloom." In vol. xi., 1899, p. 79, Dr. Chapman remarks that, in February, 1899, in the Riviera, of hibernating butterflies *atalanta* was much the most abundant; and (p. 97) on March 6th he found a full-grown larva. In vol. xii., 1900, p. 53, Mr. J. Mason notes having seen *atalanta* flying about in the bright sun on January 9th, at Clevedon Court, Somersetshire.

(14) Buckler's *Larvæ of British Butterflies and Moths*, vol. i., p. 176, the Rev. John Hellins writes, "I have not many records of this species; perhaps one of the most pleasant entomological memories is that of seeing the butterfly (*atalanta*) in good condition, flying about during a gleam of sunshine on the morning of Christmas Day, 1866; at last it settled on a child's shoulder, and was an object of admiration for some time."

With regard to the question as to whether pairing takes place before or after hibernation, I have seen it stated that females of Vanessids captured in the autumn, and dissected, show no trace of ova, or ova only slightly developed, but I have no personal knowledge of the subject. Boisduval says that impregnation takes place in the spring, but there seems to be a difference of opinion on this point. I once saw a pair of *Pyrameis cardui*, *in cop.*, at Gibraltar, on April 20th.

In very hot and dry localities in the Mediterranean, such as Malta, Gibraltar, etc., where, during the summer months, the foodplant of *atalanta* is practically burnt up, the imagines appear to æstivate, but towards the end of September or beginning of October the weather becomes cooler, the rains commence, and the nettles soon spring up, and then *atalanta* busies itself ovipositing, and, as I have before mentioned, being a long-lived species, larvæ of all sizes, and pupæ, are to be found among the food-plants, and freshly-hatched imagines begin to emerge in November.

At Alexandria, on February 8th, 1898, I found a full-grown larva spun up and preparing to pupate in a bed of nettles, other larvæ of various sizes, and a fresh imago. The larva found on the above date, produced a fine butterfly on the 28th of the same month.

From the above I think it is pretty clear that this species does hibernate in this country.

Larvæ of *Polyommatus icarus* and their connection with ants.

By A. L. RAYWARD, F.E.S.

It is, I think, not very generally known that the larva of our common blue butterfly, *Polyommatus icarus*, like those of at least three other species of our British Lycænids, is possessed of a gland which